

*Patapsco river.*—Baltimore, Maryland, 24th: navigation interrupted to some extent by ice in the harbor and river; 27th, ice broken up by boats, navigation unobstructed; 30th, considerable ice was driven by wind from the bay into the harbor and river, causing interruption to navigation.

*Monongahela river.*—Pittsburg, Pennsylvania: 19th, river full of floating ice at this place, and reported to be breaking in the upper Monongahela; 23d, ice passed out without causing damage.

Morgantown, West Virginia: 4th, river frozen over below the suspension bridge; 12th to 14th, river frozen; 15th, 16th, and 18th, ice-gorge; 19th, ice broken up and moved out.

New Geneva, Pennsylvania: 12th, heavy floating ice, boats stopped; 23d, 24th, 25th, and 28th, heavy floating ice.

*Ohio river.*—Pittsburg, Pennsylvania: 20th, large quantities of ice running, river rising rapidly; 21st, coal barges were compelled to leave during the morning to prevent destruction by the ice.

Louisville, Kentucky: 18th, navigation which had been partly suspended on account of floating ice since the 11th was resumed on this date.

Cincinnati, Ohio: 14th, 15th, 16th, floating ice in river.

Cairo, Illinois: 12th to 28th, light flow of ice, not sufficient to interrupt navigation.

Vevay, Indiana: 27th, floating ice.

Portsmouth, Ohio: 14th, 15th, 25th, 26th, 27th, floating ice, obstructing navigation on the last-mentioned date.

Wheeling, West Virginia: 3d to 7th, floating ice; 15th to 20th, ice-dam; 21st, ice broke up in river, no damage resulted.

*Tennessee river.*—Paducah, Kentucky: 11th to 26th, floating ice in river.

*Youghiogheny river.*—Confluence, Pennsylvania 14th: to 31st, river frozen.

*Lake Erie.*—Cleveland: 1st, lake frozen along the shore; 4th, lake frozen as far as the eye can reach; 17th, ice on lake seventeen inches thick.

*Detroit river.*—Detroit, Michigan: 1st to 12th, heavy masses of floating ice; 13th to 29th, solid ice; 21st, ice from three to four feet in thickness; 30th, ice began to move at 3 p. m.; 31st, southerly winds drifted the ice along the Detroit shore, leaving the Canadian shore clear until after noon, when it again extended from shore to shore, being piled up in places to a height of twelve feet.

*Oswego river.*—Oswego, New York: 10th, river frozen from the railroad bridge to the mouth.

*Mackinac straits.*—Mackinac City, Michigan: 4th, straits partly frozen over; 5th, ice drifted along the shores by the wind; 6th, ice blown out of straits; 7th, the schooner "Fleet-wing" put in port, having been badly damaged by ice; 8th, straits frozen over; 10th, ice broken up and blown out by wind; 11th, 12th and 13th, straits full of ice; 14th, straits frozen over, steamer "Algomah" stuck in middle of straits; 16th, teams crossing on ice.

*Little Bay de Noquet.*—Escanaba, Michigan: 31st, bay frozen throughout the month.

*Grand river.*—Grand Haven, Michigan: 4th, river frozen over; 12th, river clear of ice; 14th, heavy masses of drift ice have appeared at mouth of river and is pushing up the stream, rendering navigation very unsafe; 15th, river again closed by drift ice, and in the lower part of the river the ice is reported to extend from six to twelve feet below the surface; 21st, river frozen; 22d, steamer "Wisconsin" ice-bound and compelled to remain at her moorings.

*Saint Clair river.*—Port Huron, Michigan: 4th to 8th, heavy ice in river; 22d and 23, river frozen firmly from shore to shore opposite this city; 25th, pedestrians crossing on the ice.

*Lake Huron.*—Port Huron, Michigan: 9th, a large ice bridge formed at the base of the lake, and extended diagonally across from Fort Gratiot light-house to Point Edwards, on the Canadian shore; it broke on the 12th and formed again on the 16th.

*Lake Superior.*—Duluth, Minnesota: 2d, lake frozen for a distance of half a mile from shore; 7th, ice carried out by the

wind during the evening; 12th, large fields of ice blown in by the wind; 13th, ice again blown out; 14th, lake frozen; 21st, all ice carried out, except for a distance of about five hundred feet inside the breakwater; 24th, lake frozen as far as the eye can reach.

Marquette, Michigan: 3d, harbor frozen over.

*Mississippi river.*—Davenport Iowa: 31st, the river remained frozen at this place and at all points above throughout the month.

Dubuque, Iowa: 3d, the ice in the channel measured eight inches in thickness.

Cairo, Illinois: 31st, heavy flow of ice in the Mississippi during the month with occasional gorges; navigation closed north of this city.

La Crosse, Wisconsin: 30th, ice in river measures twenty-eight inches.

Keokuk, Iowa: 4th, river frozen over; 11th, teams crossing on the ice.

Saint Louis, Missouri: river full of floating ice on 2d, 3d, 5th, 6th, 7th, 9th, 10th to 16th, 21st, 23d to 29th; 30th, river clear, navigation resumed.

Clinton, Iowa: 31st, ice in river from twenty to twenty-six inches thick.

Muscatine, Iowa: 1st, ice six inches thick in channel, teams crossing; 31st, ice twenty inches thick.

Saint Paul, Minnesota: 15th, ice in river twenty-one inches thick.

*Missouri river.*—Leavenworth, Kansas: 1st to 8th, floating ice; 9th to 31st, river frozen.

Saint Joseph, Missouri: 31st, river frozen at this place, and at all points north throughout the month.

Brunswick, Missouri: 4th to 31st, river frozen.

*Yellowstone river.*—Fort Keogh, Montana: river frozen over during night of the 8th.

*Willamette river.*—Umatilla, Oregon: 2d, river frozen along the shores to a thickness of three inches; 1st, 3d, 4th, 17th and 18th, floating ice; 31st, during the past week, ice from eight to ten inches thick has been cut in the river.

*Sacramento river.*—Sacramento California: 20th, ice on the bars in river sufficiently thick to bear the weight of boys.

Folsom City, California: 20th, floating ice; very unusual occurrence at this place.

*Embarrass river.*—Charleston, Illinois: 31st, ice in river about ten inches thick.

*Grand Traverse bay.*—Northport, Michigan: 31st, bay entirely frozen over.

*Kansas river.*—Salina, Kansas: 20th, ice in river ten inches thick.

Topeka, Kansas: 31st, ice in river twelve inches thick.

*Susquehanna river.*—Catawissa, Pennsylvania: 31st, the north branch of the Susquehanna was closed during the month with ice from twelve to thirteen inches thick.

*Arkansas river.*—Little Rock, Arkansas: 22d, river reported to be frozen over sixty miles north, and is full of floating ice at this station.

Fort Smith, Arkansas: 9th, 21st, and 22d, floating ice in river.

*Miscellaneous.*—Wicklow, Dakota: 15th, ice on lake twenty-five inches thick; 31st, ice twenty-nine inches thick.

Thornville, Michigan: 31st, ice on ponds in vicinity ten inches thick.

Port Huron, Michigan: 4th, ice harvested from Black river from eight to nine inches thick.

Palermo, New York: 31st, ice in ponds in vicinity twenty inches thick.

#### TEMPERATURE OF WATER.

The temperature of water as observed in rivers and harbors, at the Signal Service stations, with the average depth at which the observations were made, are given in the table below. In this table are also shown the highest and lowest observed water temperatures of the month, with the monthly ranges, and the monthly mean temperature of the air for the various stations.

At the following stations no observations were made during the month, on account of ice: Alpena, Michigan; Buffalo, New York; Chicago, Illinois; Cleveland, Ohio; Detroit, Michigan; Escanaba, Michigan; and Sandusky and Toledo, Ohio. Observations, were interrupted on account of ice formation at other stations as follows: Grand Haven, Michigan, from 4th to 11th, and from 21st to 31st; Milwaukee, Wisconsin, from 2d to 31st; New London, Connecticut, from 25th to 31st; Mackinac City, Michigan, from 2d to 4th, and from 8th to 31st; Marquette, Michigan, from 3d to 31st; Duluth, Minnesota, from 2d to 7th, 9th, 12th, and from 14th to 31st. At Indianola, Texas, the instrument was broken on the 14th, and no observations were made after that date.

*Temperature of Water for January, 1883.*

| STATION.                      | Temperature at bottom |      | Range | Average depth, feet and inches. | Mean temperature of the air at station. |
|-------------------------------|-----------------------|------|-------|---------------------------------|---|
|                               | Max.                  | Min. |       |                                 |   |
| Atlantic City, New Jersey     | 36.5                  | 34.6 | 1.9   | 6 8                             | 30.0                                    |
| Alpena, Michigan*             | 52.0                  | 41.5 | 10.5  | 16 0                            | 49.2                                    |
| Augusta, Georgia              | 34.5                  | 31.0 | 3.5   | 10 0                            | 32.3                                    |
| Baltimore, Maryland           | 36.8                  | 30.3 | 6.5   | 9 7                             | 29.9                                    |
| Block Island, Rhode Island    | 33.8                  | 28.8 | 5.0   | 25 0                            | 25.1                                    |
| Boston, Massachusetts         | 69.0                  | 46.0 | 23.0  | 8 5                             | 58.5                                    |
| Buffalo, New York*            | 51.9                  | 47.1 | 4.8   | 40 10                           | 51.4                                    |
| Cedar Keys, Florida           | 40.0                  | 29.0 | 11.0  | 5 8                             | 33.5                                    |
| Charleston, South Carolina    | 38.4                  | 31.7 | 6.7   | 5 2                             | 31.6                                    |
| Chicago, Illinois*            | 54.0                  | 32.4 | 1.6   | 15 9                            | 1.8                                     |
| Chincoteague, Virginia        | 37.8                  | 33.3 | 4.5   | 17 0                            | 19.2                                    |
| Cleveland, Ohio*              | 54.0                  | 35.0 | 18.0  | 14 8                            | 51.0                                    |
| Detroit, Michigan*            | 28.8                  | 28.0 | 0.8   | 19 0                            | 20.4                                    |
| Delaware Breakwater, Delaware | 53.1                  | 44.1 | 9.0   | 8 3                             | 49.5                                    |
| Duluth, Minnesota*            | 60.0                  | 52.0 | 8.0   | 18 0                            | 57.9                                    |
| Eastport, Maine               | 78.6                  | 68.0 | 10.6  | 16 3                            | 72.3                                    |
| Escanaba, Michigan*           | 32.5                  | 32.0 | 0.5   | 13 0                            | 16.0                                    |
| Galveston, Texas              | 34.0                  | 34.0 | 0.0   | 10 6                            | 12.3                                    |
| Grand Haven, Michigan*        | 31.6                  | 31.6 | 0.0   | 8 0                             | 12.7                                    |
| Indianola, Texas*             | 55.5                  | 47.0 | 8.5   | 10 4                            | 52.7                                    |
| Jacksonville, Florida         | 35.0                  | 29.7 | 5.3   | 15 1                            | 23.8                                    |
| Key West, Florida             | 39.0                  | 33.0 | 6.0   | 13 0                            | 29.6                                    |
| Mackinac City, Michigan*      | 39.2                  | 29.7 | 6.5   | 10 5                            | 27.0                                    |
| Marquette, Michigan*          | 35.7                  | 29.7 | 6.0   | 10 10                           | 27.8                                    |
| Milwaukee, Wisconsin*         | 42.0                  | 34.0 | 8.0   | 17 4                            | 39.1                                    |
| Mobile, Alabama               | 59.3                  | 49.8 | 9.5   | 17 1                            | 54.5                                    |
| Montpelier, Vermont           | 34.5                  | 30.0 | 4.5   | 18 9                            | 21.4                                    |
| New Haven, Connecticut        | 41.5                  | 31.4 | 10.1  | 56 2                            | 37.6                                    |
| New London, Connecticut       | 48.2                  | 42.3 | 5.9   | 9 2                             | 58.6                                    |
| Newport, Rhode Island         | 38.0                  | 31.0 | 7.0   | 14 0                            | 26.1                                    |
| New York City                 | 74.0                  | 60.6 | 13.4  | 10 10                           | 68.2                                    |
| Norfolk, Virginia             | 36.3                  | 31.1 | 5.2   | 1 8                             | 28.4                                    |
| Pensacola, Florida            | 49.4                  | 46.8 | 2.6   | 31 6                            | 46.5                                    |
| Portland, Maine               | 50.0                  | 45.6 | 4.4   | 14 3                            | 54.2                                    |
| Portland, Oregon              | 49.0                  | 43.0 | 6.0   | 10 0                            | 45.8                                    |
| Port Eads, Louisiana          | 46.5                  | 42.5 | 4.0   | 13 0                            | 47.2                                    |
| Provincetown, Massachusetts   |                       |      |       |                                 |   |
| Punta Rassa, Florida          |                       |      |       |                                 |   |
| Sandusky, Ohio*               |                       |      |       |                                 |   |
| Sandy Hook, New Jersey        |                       |      |       |                                 |   |
| San Francisco, California     |                       |      |       |                                 |   |
| Savannah, Georgia             |                       |      |       |                                 |   |
| Smithville, North Carolina    |                       |      |       |                                 |   |
| Toledo, Ohio*                 |                       |      |       |                                 |   |
| Wilmington, North Carolina    |                       |      |       |                                 |   |

\* Observations wanting, see text.

The largest monthly ranges of water temperature are: Cedar Keys, Florida, 23°; Galveston, Texas, 18°; Punta Rassa, Florida, 13°4; Chincoteague, Virginia, 11°. The smallest are: Atlantic City, New Jersey, 1°9; San Francisco, California, 2°6; Baltimore, Maryland, 3°5; Wilmington, North Carolina, 4°; Savannah, Georgia, 4°4; Eastport, Maine, 4°5; Portland, Maine, 4°5.

#### ATMOSPHERIC ELECTRICITY.

##### AURORAS.

But few auroral displays occurred during the month, none of which were noted for brilliancy or extent of observation. The display of the 26th was the most generally observed, and this was reported by but few observers, all in New England; they are as follows:—

Eastport, Maine, 26th.—Faint auroral light observed from 7 to 9 p. m.

Mount Washington, New Hampshire, 26th.—At 7.10 p. m., an aurora was observed, consisting of rays of whitish light, emanating from a dark segment of about 4° altitude. Streamers rose to a height of from 7° to 12° above the dark segment. The display was most brilliant in the north-northeastern sky, and ended at 9.45 p. m., leaving a luminous cloud.

Burlington, Vermont, 26th.—An aurora was observed from

10.00 to 10.30 p. m., consisting of broad bands of white light, which extended across the sky from southeast to northwest.

Provincetown, Massachusetts, 26th.—Faint auroral display observed from 7.30 to 9.00 p. m.

The other displays reported as follows:—

Eastport, Maine, 5th.—Faint auroral light of pale straw-color, observed at 7.00 p. m.; the display continued until early morning of the 6th.

Alexandria, Dakota, 5th.—Aurora consisting of faint luminous beams extending to an altitude of 30°, with an arch and dark segment beneath. The display was first observed at 8.00 p. m., was brightest at 9.00, and very faint at 10.00 p. m.

Northfield, Minnesota, 6th.—A faint auroral light was observed from 3.00 to 5.00 a. m. A faint display was also observed at 5.00 a. m. of the 7th, extending upward 40° in the northeastern sky.

Gardiner, Maine, 7th.—Faint aurora observed after 11.00 p. m., was still visible without change at 2.00 a. m. of the 8th.

Escanaba, Michigan, 7th.—Faint aurora in the northern sky at 9.30 p. m.; it consisted of a diffuse pale-green light with the usual dark base.

Vevay, Indiana, 9th.—Faint aurora observed at 8.30 p. m.

Clinton, Missouri, 10th.—Faint auroral light in the north, at 8.30 p. m.

Kittyhawk, North Carolina, 15th.—An aurora of light silvery-color was observed from 11.15 to 11.28 p. m., causing interruption to telegraphic communication during its presence.

Canal Dover, Ohio, 20th.—Aurora observed at 9.00 p. m.

Terry's Landing, Montana, 23d.—Faint aurora from 6.30 to 7.30 p. m.

Rowe, Massachusetts, 25th.—Aurora observed from 7.00 to 9.00 p. m.

#### ATMOSPHERIC ELECTRICITY INTERFERING WITH TELEGRAPHIC COMMUNICATION.

Vicksburg, Mississippi, 16th.—During the evening, the telegraph lines were charged with atmospheric electricity, causing the wires to work badly.

Fort Keogh, Montana, 20th.—An electric storm began at 6.10 p. m. and continued until after midnight. The telegraph-wires were worked, although the line was open both east and west of station, and continuous sparks were emitted from the switch-board.

Fort Maginnis, Montana, 12th.—During the prevalence of a violent hurricane on this date, a very remarkable electrical phenomenon was observed. The metallic parts of the telegraph-instruments were enveloped in a brilliant bluish light, and emitted a sharp snapping noise. The current was so powerful as to burn the hard rubber on the instruments, and fuse the brass on the lightning-arrester. The phenomenon was also observed at other places. All reports state that metallic points, &c., were tipped with light.

Visalia, California, 1st.—The telegraph-wires were affected by atmospheric electricity on this date.

#### THUNDER-STORMS.

Thunder-storms were reported in the various districts on the following dates:—

New England.—31st.

Middle Atlantic states.—31st.

South Atlantic states.—17th, 19th, 27th, 28th, 29th.

Florida peninsula.—7th, 8th, 9th, 14th, 25th.

Eastern Gulf.—6th, 13th, 15th to 20th, 27th, 28th.

Western Gulf.—3d, 6th, 7th, 13th to 20th, 26th, 27th.

Tennessee.—18th, 20th.

Ohio valley.—20th.

Missouri valley.—12th, 13th, 20th.

Southern slope.—Fort Concho, Texas, 2d, 26th.

The following instances of damage by lightning have been reported:—

Brooklyn, New York, 31st.—A house in this city was struck by lightning; three windows were broken; furniture and chandeliers were damaged, and one person seriously stunned.